

Further Studies of Waves Accompanying the Solar Wind Pick-Up of Interstellar Hydrogen

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The first reported observations of interstellar hydrogen ions by the Ulysses SWICS investigation renewed the search in the magnetic field data for the accompanying hydromagnetic waves. Several examples were found of waves whose spectra exhibited a cutoff at the hydrogen ion gyrofrequency and left-hand polarization as predicted by theory. The waves were detected initially in radial magnetic fields, i.e., parallel to the solar wind flow, rather than in a transverse field as had been anticipated by theory. Further modeling demonstrated, however, that the observed spectra could be matched by the theory when applied to radial fields. Analytic techniques based on dynamic spectra (frequency vs. time) and cross-spectra have been developed to continue the search for more examples of waves and to gather statistical information about their occurrence. The possibility that the waves are associated with Jovian electrons rather than interstellar ions has also been pursued by comparing the wave occurrences with relativistic electrons being measured simultaneously by the Ulysses COSPIN investigation (J. A. Simpson, PI). These and other recent developments will be presented and discussed.

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